

A new and an unrecorded species of *Melittia* (Lepidoptera, Sesiidae) from North Vietnam

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Abstract One new species, *Melittia pijiae* spec. nov., is described from North Vietnam. It is closest to *M. hampsoni* Beutenmüller, 1894, but can be easily separated both by characters of the genitalia and by external appearance. Another species of *Melittia*, *M. sangaica sangaica* Moore, 1877, is recorded from Vietnam for the first time.

Key words Lepidoptera, Sesiidae, *Melittia*, new species, Oriental region, Vietnam, taxonomy.

The Melittiini fauna of Vietnam has been reviewed by Gorbunov & Arita (1995) and Arita & Gorbunov (2000) recently. The authors described several new species and listed a total of 17 species of Melittiini from Vietnam. Here we can report the finding of another new species and a species previously not mentioned from Vietnam.

Material mentioned in this work is deposited in the following collections: The Natural History Museum, London, England (BMNH); University Museum, Oxford University, Oxford, United Kingdom (UMO); Department of Zoology, National Science Museum, Tokyo, Japan (NSMT); Collection Axel Kallies, Berlin, Germany (CAK); Collection Hans Riefenstahl, Hamburg, Germany (CHR).

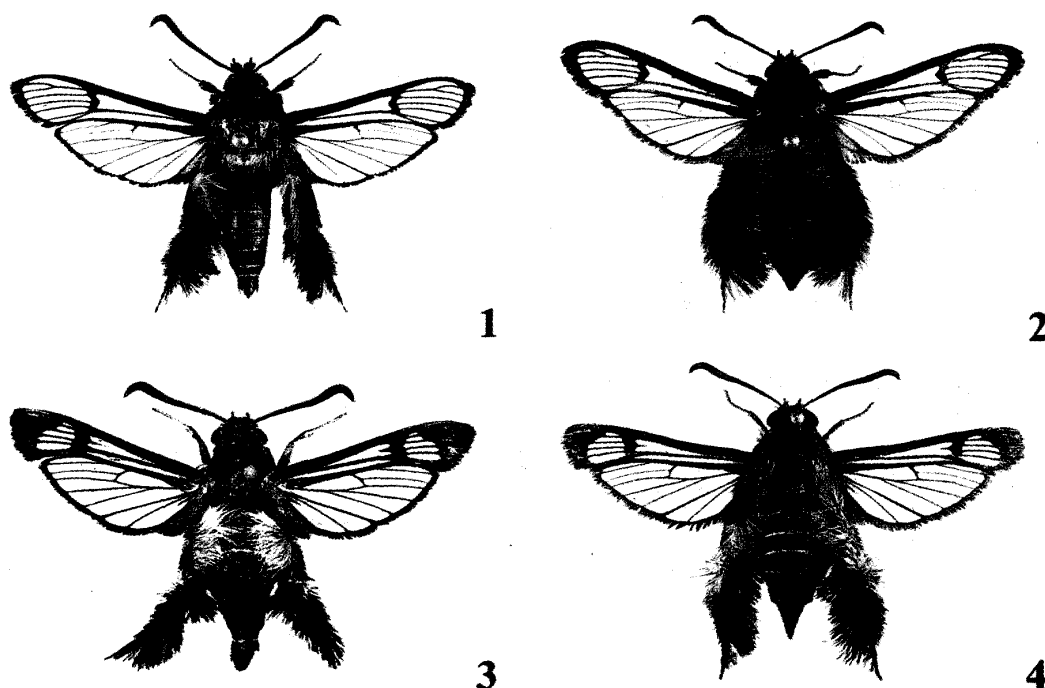
This study was supported in part by the Grants-in-aid Nos 09041167 and 06041116 for Field Research of Monbusho International Scientific Research Program, Japan.

The following abbreviations have been used: ETA—external transparent area of forewing; ATA—anterior transparent area of forewing; PTA—posterior transparent area of forewing.

Melittia pijiae spec. nov. (Figs 1, 2, 5, 6)

Description. Holotype, ♀ (Fig. 2). Alar expanse 39.5 mm; forewing length 18 mm, body length 20 mm, antenna 8 mm.

Head: antenna black dorsally; labial palpus black, mixed with white scales dorso-laterally, mixed with dark grey and white ventrally, basal joint additionally tufted with white scales ventrally; frons grey shining; vertex black mixed with single white scales; pericephalic scales black, mixed with single white scales dorsally, white ventrally. **Thorax:** black, posteriorly with fine yellow hair-like scales; metathorax deep yellow dorsally. **Legs:** forecoxa black, basally white with yellow scales; foretibia with some yellow scales basally and some white scales apically; foretarsus black, orange-yellow scaled; midcoxa white, orange and yellow mixed; midfemur black, at posterior side with long white tufted scales basally; midtibia black in basal half and with long tufted yellow hair-like scales in distal half near the tibial spurs; midtarsus black, orange-yellow ventrally, basal tarsomere with yellow hairs ventro-basally; hindleg black, hindfemur with long tufted hair-like scales dorsally, orange-yellow throughout



Figs 1-4. *Melittia* species from N. Vietnam. 1. *M. pijiae* sp. nov., ♂, paratype, Tam Dao (NSMT). Alar exp. 28.0 mm. 2. *Ditto*, ♀, holotype, Tam Dao (CHR). Alar exp. 39.5 mm. 3. *M. sangaica sangaica* Moore, 1877, ♂, Cuc Phuong (CAK). Alar exp. 36 mm. 4. *Ditto*, ♀, Tam Dao (CHR). Alar exp. 42 mm.

in basal portion, black, but yellow apically in middle part, black throughout in distal portion; hindtibia basally and tibial spurs white on ventral side; tibial spurs with long tufted black scales, external spurs with additional long and narrow orange scales; basal hind tarsomere with long tufted black, externally orange scales at dorsal side, remaining tarsomeres short scaled, black, internally orange-yellow. Abdomen: tergites black shining, tergites 5 and 6 densely covered with deep yellow scales, tergite 6 less densely in posterior part; sternites 1-2 black, dirty yellow laterally; remaining sternites black, but densely scattered with dirty-yellow scales; anal tuft black, yellow ventrally.

Forewing: veins deep black; apical area reduced to a narrow black margin; cell Cu_1 - Cu_2 transparent; discal spot narrow, pointed into ATA; veins black, but especially in middle part scattered with single white scales; fringe black. Hindwing: veins black, fringe black, yellow in anal area; anal area densely yellow scaled.

Female genitalia (gen. prep. No GA-196/1763 YA, Fig. 6). Posterior apophysis about as long as anterior pair, the latter with a small ventro-basal hook; signum of corpus bursae relatively small, consisting of numerous minute sclerotizations, forming a ring around base of ductus bursae; ductus bursae membranous; ostium bursae relatively wide, opening as a narrow well-sclerotized ring.

Male (paratype) (Fig. 1). Alar expanse 38.0 mm; forewing length 17.0 mm, body length 18.5 mm; antenna 10.0 mm.

Similar to female, but differing by the following characters: forewing with apical margin little narrower, veins black without white scales; hindwing with anal area yellow mixed with black. Metathorax with only a few yellow scales; abdomen black almost throughout,

tergites 3 and 4 with only a few yellow scales at posterior margins; legs with midfemur black, at posterior side with long white tufted scales basally; midtibia black with a white spot and long tufted yellow hair-like scales near the tibial spurs; hindleg black, hindtibia with long tufted hair-like scales dorsally, yellow throughout in basal portion, black, but yellow apically in middle part, black throughout in distal portion.

Male genitalia (prep. No AK130, Fig. 5). Tegumen-uncus complex relatively broad and strong, especially the uncus portion; uncus bilobed, distally with a plate of stout dark bristles internally on each side; gnathos rather small, membranous with two slightly sclerotized plates latero-basally; valva broad, broadened distally, distal field of setae relatively small, ventro-apical lobe of valva very broad and short, with short and strong setae at outer margin; saccus short; aedeagus somewhat longer than valva.

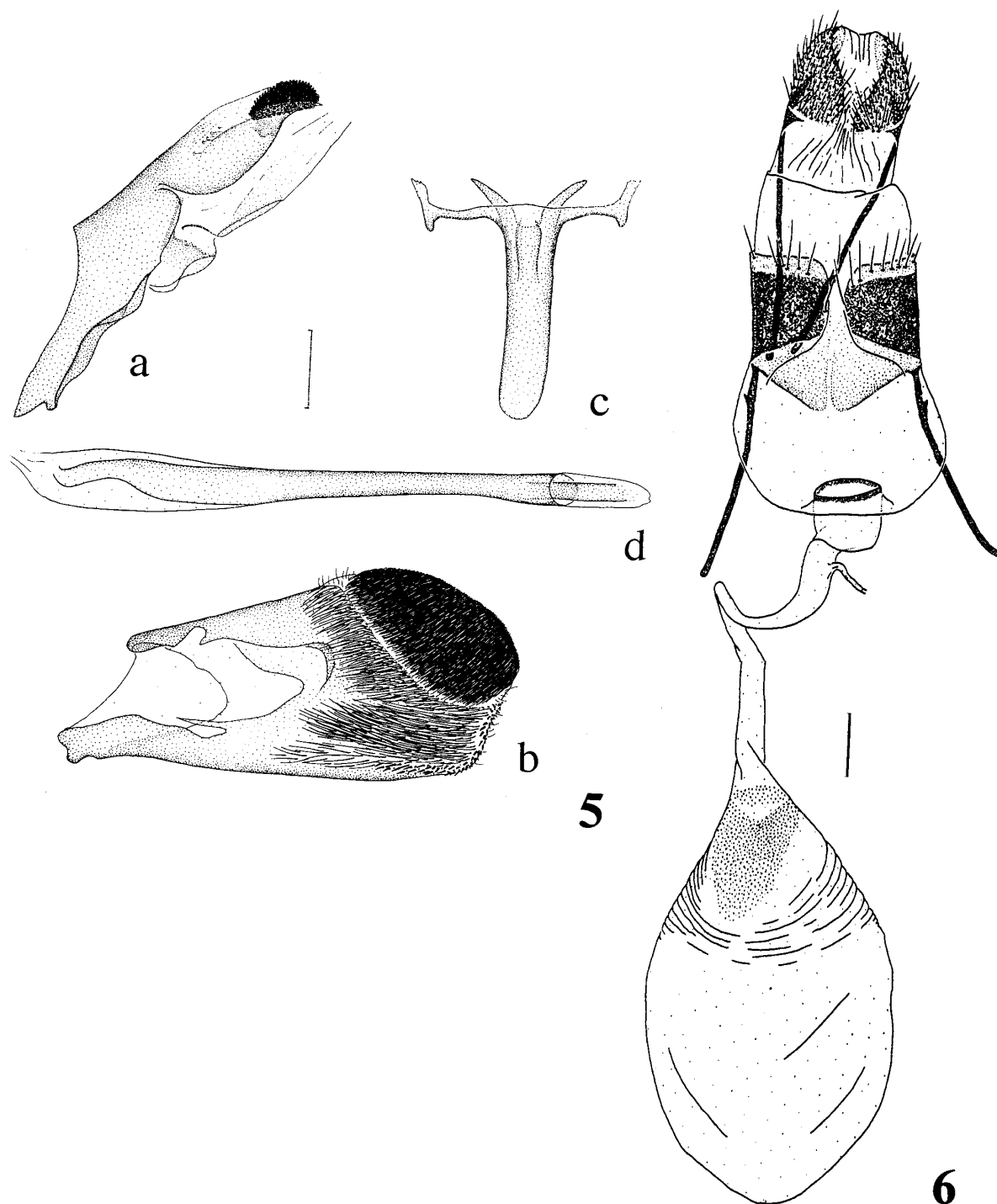
Variability. Variable only in size with alar expanse in males 34.5–38.0 mm, in females 30.0–39.5 mm.

Diagnosis. The new species is very unusual both in external appearance and in morphology of genitalia among the Oriental *Melittia*. By the shape of the transparent areas it belongs to a small group of Oriental *Melittia* species with a transparent cell between veins Cu_1 and Cu_2 . This character is seen only in *M. newara* Moore, 1879, *M. cucphuonga* Arita & Gorbunov, 2000, *M. romieuxi* Gorbunov & Arita, 1996, *M. uenoi* Arita & Gorbunov, 2000, *M. hampsoni* Beutenmüller, 1894, *Desmopoda bombiformis* Felder, 1874 (*Desmopoda* Felder, 1874 is most likely a younger synonym of *Melittia* Hübner, 1819), and the species of the *M. rutilipes* Walker, 1865 species group (besides *M. rutilipes*, including *M. tabanus* Le Cerf, 1916, *M. moluccaensis* Hampson, 1919, *M. tigripes* Diakonoff, 1954, **stat. nov.**, *M. ferroptera* Kallies & Arita, 1998).

By external characters and the male genitalia *M. pijiae* sp. n. is closest to *M. hampsoni*. The latter can be distinguished easily by the colouration of the abdomen (tergite 1 grey basally, olive distally; tergites 2 to 7 blackish brown, olive scaled basally; all tergites with a narrow yellowish olive posterior margin; anal tuft olive-brown, yellowish laterally; sternites yellow throughout; thorax olive-grey), the broader discal spot and apical area of the forewing, and the black anal area of the hindwing. In male genitalia *M. hampsoni* differs by the shape of the valva (apical setaceous lobes smaller). By the shape of the transparent areas *M. pijiae* sp. n. is also somewhat similar to *M. uenoi*, which is known from a single female only. It differs by the lack of the yellow colouration of the metathorax and the abdominal tergites 3–6, and, more important, by the structure of the genitalia (corpus bursae with a large pear-shaped area of minute spinules). *M. cucphuonga* and *M. newara*, which are known from males only, differ from *M. pijiae* sp. n. by shape of the ETA (smaller, cell between Cu_1 and Cu_2 very small) and by the genitalia (dorso-apical setaceous lobes of valva smaller, different shape of gnathos and uncus). Besides additional external and genitalia characters, the species of the *M. rutilipes* group and *D. bombiformis* differ by the shape and colouration of the discal spot (large, brownish, with a particular projection into ATA), and the colour of the markings of the hindleg tufts (rusty orange to brown).

Bionomics and habitat. At the type locality, the specimens were collected in a ruderal area close to the edge of secondary montane forest. The holotype and a male paratype were found in copula in the early morning hours. An additional male was collected at the same locality at the artificial pheromone lures in the morning.

Although at type locality Sesiidae were collected quite regularly at various times, all known specimens were found in May only, indicating a single generation per year, which starts in



Figs 5–6. Genitalia of *Melittia pijiae* sp. nov. 5. ♂, paratype (gen. prep. AK130) (CAK).
 a. Tegumen-uncus complex. b. Valva. c. Saccus. d. Aedeagus. 6. ♀, paratype
 (No. GA-196/1763 YA) (NSMT). Scale bars: 0.5 mm.

April and lasts not longer than end of May.

Material examined: Holotype, ♀, Vietnam, Prov. Vinh Phu, Tam Dao, 950 m, 3. V. 1998, leg. Riefenstahl & Wagenblass (CHR). Paratypes: 1 ♂, with same data as holotype (collected in copula); 1 ♂, with same locality and collector, 5. V. 1998; 1 ♀, N. Vietnam, Cao Bang, Mt Pia Oac, 25. V. 1998, H. Karube leg. (gen. prep. No GA-196 / 1763 YA) (NSMT).

Etymology. This delicate and beautiful new species is dedicated to Birgit "Piji" Wagenblass, the wife of our friend Hans Riefenstahl. She contributed to the success of the collecting trip of Hans and the senior author to Vietnam and discovered the first specimens of the species described here.

***Melittia sangaica sangaica* Moore, 1877 (Figs 3, 4)**

Melittia sangaica Moore, 1877: 84. Type locality: Shanghai. Syntypes in BMNH; Le Cerf, 1917: 206; Hampson, 1919: 90; Dalla Torre & Strand, 1925: 148; Gaede, 1933: 790; Heppner & Duckworth, 1981: 27; Spatenka *et al.*, 1993: 90.

Melittia humerosa Swinhoe, 1892: 38. Type locality: "North China". Holotype female, in UMO; Hampson, 1919: 90 (as a synonym of *M. gigantea* Moore, 1879); Dalla Torre & Strand, 1925: 144 (as a synonym of *M. gigantea* Moore, 1879); Heppner & Duckworth, 1981: 26 (as a synonym of *M. gigantea* Moore, 1879); Spatenka *et al.*, 1993: 90 (as a synonym of *M. sangaica sangaica* Moore, 1877); Arita & Gorbunov, 1995: 191–196, figs 5, 6, 21, 25 (as a synonym of *M. sangaica sangaica* Moore, 1877).

Description. ♂. Alar expanse 36 mm, forewing 16 mm, body 21 mm, antenna 9 mm.

Head: first joint of labial palpi cream-yellow with single black scales laterally; middle joint black ventrally, strongly mixed with white, white yellow exteriorly and interiorly, apical joint black ventrally, yellowish white mixed with black dorsally; antenna black dorsally, brownish ventrally; frons greyish black, white-cream laterally; vertex black mixed with ochre scales, pericephalic scales ochre brown dorsally, yellowish white ventrally. **Thorax:** black, densely covered with ochre-brown scales dorsally; patagia ochre-brown to blackish; ventrally pale grey, pale yellow in anterior part. **Legs:** forecoxa yellow-white mixed with black, forefemur black ventro-anteriorly, pale yellow ventro-exteriorly, yellow with single black scales dorsally; foretibia and foretarsus yellow with single black scales, with a black anterior margin; mid- and hindcoxae pale yellow-white basally, black distally; midfemur ventrally black with pale yellow anterior and posterior margins and orange-brown scales distally; midtibia blackish with long pale yellow scales ventrally and an admixture of black and orange-brown scales dorsally, spurs black; midtarsus black, with a white spot basally; hindfemur black with a broad white anterior margin; hindtibia black ventrally, with white spots in basal and distal half, dorsally with tufted orange-brown scales exteriorly and long tufted pale yellowish scales interiorly; spurs black, exterior spur with long black, apically white scales; hindtarsus black, with long tufted black scales dorsally. **Abdomen:** tergites black, each with a posterior margin consisting of black, white and grey scales; sternites black, densely covered with pale yellow scales.

Forewing: veins black, with ochre-brown scales near base; discal spot broad, with strong, relatively short projection into the ATA and a small inversion between R_4 – R_5 and M_1 at its exterior margin; apical area black with single white scales; ETA consisting of 5 cells, narrow at costal margin, broader towards the posterior margin; fringe black; ventral side similar. **Hindwing:** veins and fringe black; anal area black with some ochre-brown scales basally; ventral side similar.

Male genitalia (prep. No. AK219). Uncus-tegumen complex relatively long and narrow; gnathos consisting of two narrow and weakly sclerotized lobes; uncus apically bilobed, with a field of dark stout bristles on each side; tuba analis membranous, weakly sclerotized ventrally; valva relatively long and narrow, not broadened distally; distal field of setae relatively small; setae of medial field of valva not reaching the pocket-shaped crista; ventro-

apical lobe of valva narrow and long, well exceeding the distal margin of valva; aedeagus about as long as valva; saccus short, apically spoon-like broadened.

Female (Fig. 4). The female was redescribed in detail by Arita & Gorbunov (1995). It is similar to male, but differs as follows: larger (alar expanse 42 mm), thorax more orange-brown scaled dorsally; discal spot of forewing somewhat narrower, with single orange scales at exterior margin; ETA somewhat broader; anal area of hindwing covered with orange-yellow to reddish scales; hindtibia with more bright and more extended orange-brown tufted scaling dorso-laterally.

Female genitalia (prep. No. AK203). The female genitalia perfectly correspond to the figure and description of the genitalia of *M. sangaica sangaica* given by Arita & Gorbunov (1995: figs 5, 6, 21, 25) (holotype of *M. humerosa*).

Diagnosis. The species is similar to a number of species or subspecies of the *M. sangaica* group. From *M. sangaica nipponica* it differs by the white spots of the hindtibia ventrally (yellow in *nipponica*); the pale yellow markings of the thorax ventrally and the pale yellow tufted scales of the hindtibia (deep yellow in *nipponica*); the ochre-brown scaling of the thorax dorsally (orange-yellow in *nipponica*), and the slightly narrower ETA in male. Both taxa are very similar in genitalia: in male of *M. s. sangaica* the sclerotized parts of the gnathos are somewhat shorter and the apical projection of the valva is a little longer, in female the signum is slightly larger (see figures given in Arita & Yata (1987) and Spatenka *et al.* (1999)). *M. s. sangaica* is as well similar to *M. gorochovi* and partly occurs in the same localities in Vietnam. However, *M. gorochovi* differs by the smaller size (alar expanse 28–31 mm), the longer projection of the discal spot of the forewing, the longer cell between R_4 – R_5 and M_1 , and the lack of an inversion of the exterior margin of the discal spot of the forewing between R_4 – R_5 and M_1 . Differences from other species of the group were described by Arita & Gorbunov (1995).

Material examined: 1 ♂, North Vietnam, Ninh Binh Prov., Gia Vien, Cuc Phuong N. P., secondary forest, 370 m, 28–30. VI. 1999 (Ph.), leg. A. Kallies, genitalia examined by A. Kallies, prep. No. AK219 (CAK); 1 ♀, Vietnam, Prov. Vinh Phu, Tam Dao, 950 m, 8. V. 1998, leg. Riefenstahl & Wagenblas, genitalia examined by A. Kallies, prep. No. AK203 (CHR).

Remarks. The differences between *M. s. sangaica* and *M. s. nipponica* in the present view would support a species independence of both taxa. However, neither the type material of *M. s. sangaica* Moore, 1877 was examined nor the individual variability of the species in its south east Asian mainland distribution range is known. For this, we prefer not to change the present taxonomic situation.

Acknowledgements

Our hearty thanks are due to Hans Riefenstahl (Hamburg, Germany) and Mr H. Karube (Kanagawa Prefectural Museum of Natural History, Odawara, Japan) for giving us the opportunity to study the Sesiidae material of their collections and for presenting specimens for our work. We express our cordial gratitude to Profs Ha Quang Hung and Tran Dinh Chien (Hanoi Agricultural University, Vietnam), for their constant support during lepidopterological survey in Vietnam. Additionally we want to thank our friend Oleg Gorbunov (Moscow, Russia), who made the drawing of the female genitalia of the species described here.

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摘 要

北ベトナム産 *Melittia* 属 (鱗翅目, スカシバガ科) の 1 新種および 1 未記録種 (有田 豊・Axel Kallies)

ベトナムの Melittiini 族は Gorbunov & Arita (1995) および Arita & Gorbunov (2000) によって 17 種類記録されている。今回、著者らは新たに 1 新種と 1 未記録種を北ベトナムから見だし記載した。

Melittia pijiae sp. nov. (Figs 1, 2, 5, 6)

本種は雌雄共に前翅の中室外方透明紋が大きく広がり、外縁部の黒い部分が非常に細くなっている。このような特徴を持つ種類は幾らか知られているが、後脚の長毛の色彩で区別される。雌雄のゲニタリアも異なる。ベトナム北部の Tam Dao で交尾個体が採集され、その後 2 番目の♂個体がフェロモントラップに飛来した。

Melittia sangaica sangaica Moore, 1877 (Figs 3, 4)

本種の雌ゲニタリアは *M. sangaica sangaica* (holotype of *M. humerosa*) に一致したので原名亜種と同定した。また雄ゲニタリアも日本の亜種 *M. sangaica nipponica* に僅かな違いがあるもののほぼ一致したので本種と同定した。本種はベトナムからは新記録である。

(Accepted July 8, 2000)

Published by the Lepidopterological Society of Japan,
5-20, Motoyokoyama 2, Hachioji, Tokyo, 192-0063 Japan